DOCUMENT RESUME

ED 074 076 TM 002 438

AUTHOR Andrulis, Richard S.
TITLE An Evaluation of the Audio Workbook System. R & D Report.
INSTITUTION American Coll. of Life Underwriters, Bryn Mawr, Pa. Zimmerman Adult Learning Lab.
PUB DATE 73
NOTE 16p.; Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Louisiana, 1973

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Audiovisual Instruction; Comparative Analysis; *Course Evaluation; Data Collection; *Evaluation Techniques; Instructional Materials; Phonotape Recordings; Post Secondary Education; *Program Evaluation; Student Attitudes; *Summative Evaluation; Tables (Data); Technical Reports
IDENTIFIERS American College of Life Underwriters; *Cassette Review Program

ABSTRACT

The Cassette Review Program (CRP), developed by The American College of Life Underwriters, is organized into 10 sections corresponding to the 10 courses of the American College C.L.U. diplcma program. It includes both audio tapes and notebooks. The formative evaluation of the CRP carried out in 1971 resulted in a restructuring of both the tapes and notebooks, as well as the clarification of selected content material. A summative evaluation of CRP courses 2 and 4 was carried out in 1972. The evaluation was conducted using a design called "Separate Sample Pretest Posttest," to ascertain the effects of the two courses on student performance. Students, classified as self-studying or classroom, were selected at randcm to participate in the study. In total, 16 teachers and 368 students took part in the evaluation. A multiple-choice test was used to measure student knowledge of the CRP material, and two of the four groups of students also received a questionnaire to obtain data on the amount and type of use of the CRP, as well as on the technical aspects of the program. The test results were subjected to an analysis of variance with an unweight d-means solution. The results indicated that students who utilized CRP, in a self-studying or classroom mode, did significantly better than students who did not use CRP. The evaluation points up the significance of the CRP as an instructional device with technical excellence. The questionnaire replies indicated a favorable attitude among the users of the CRP. It is recommended that the tests used in the evaluation be incorporated as part of the CRP package. (DB)

ED 074076

TM 002 438

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

R&D REPORT

AN EVALUATION OF

THE AUDIO WORKBOOK SYSTEM

Occasional Paper# _____

Zimmerman Adult Learning Laboratory

AN EVALUATION OF THE AUDIO WORKBOOK SYSTEM[1]

Richard S. Andrulis

The American College of Life Underwriters

Bryn Mawr, Pennsylvania

Introduction

The Cassette Review Program (CRP), developed by The American College of Life Underwriters, has been in limited use for the year 1971-1972. The system was intended to fulfill the primary objective of providing a mechanism for students of the American College to prepare for examinations of the Chartered Life Underwriter diploma program.

Development - Formative Evaluation

The CRP, which is organized into ten sections corresponding to the ten courses of the American College C.L.U. diploma program, includes both audio tapes and notebooks. The tapes are played on a cassette tape recorder by the student, accompanied by the associated textual material incorporated within the notebooks.

The CRP utilizes a format of presentation of the objectives in the accompanying response booklet. After the student has read the objective for each assignment of the C.L.U. study guide, he is asked to turn on the cassette recorder. The material contained on the cassette tapes explains and describes information concerning each of the stated objectives. At the end of the first explanation for objective one, a question is either listed in the response booklet or on the tape. The student is requested to write out his answer and check his response with a key sheet provided in the response booklet, or to listen to the tape for the correct answer. The reinforcement of this audio-programmed instruction method provides

[1]Paper Presented at the Annual Meeting of the American Educational Research Association, New Orleans, Louisiana, 1973.

a mechanism whereby information is presented and asked for with a written confirmation of the student's response. At times a clarification is given to the student after he has confirmed the answer he has written. The intent of the clarification is to provide further insight into the answer.

Furthermore, each objective is tested by only one question in the response booklet. Since the nature of the CRP is for review only, and not for initial learning, it was felt that no need existed for extensive questioning of the student. No norms are provided to the student as to the degree of proficiency in answering the questions from the tape or response booklet. The rationale for this is the summary and review nature of the CRP, rather than that of a total and thorough learning system.

The logic of the evaluation system dicated that any efforts toward evaluation of the CRP should incorporate the two concepts of formative and summative evaluation. A plan was devised to answer the questions raised in both the formative and summative mode during 1971-1972.

The formative evaluation was implemented by the CRP developers during the summer and fall of 1971 (Langdon, 1971). Information accrued from both content judges and field participants resulted in a restructuring of both the tapes and notebooks as well as the clarification of selected content material. Further results indicated that the quality of voices, clarity of instructions, presentation and format of material were relatively free of major problems. The results forthcoming from this initial formative step indicated that the objectives and goals of the CRP were met. However, what portion of the final C.L.U. examination score is due to the effects of the CRP remained unanswered.

Summative Evaluation

During the spring of 1972 an evaluation was carried out on the CRP for courses 2 and 4. The evaluation was conducted using a design entitled "Separate Sample Pretest Posttest" (Campbell and Stanley, Experimental and Quasi-Experimental Design for Research, 1963). This design was utilized for the purposes of ascertaining the effects of the CRP for Course 2 and Course 4 on C.L.U. student performance. This design incorporated the use of four conditions. These conditions are as follows:

Condition A Students - Received a pretest and a Cassette Review Program, but no posttest.

Condition B Students - Received no pretest, but received a Cassette Review Program and a posttest.

Condition C Students - Received a pretest only.

Condition D Students - Received a posttest only.

However, realizing there are two methods of preparation for C.L.U. courses, the design was modified to accommodate for this key element. The accommodation of the design included the replication of the A, B, C and D conditions, for both the self-studying students and the classroom students.

Methodology

To accommodate both self-studying and classroom students in this study, a procedure was implemented to identify the students in one of these two categories. Utilizing the records of the American College, self-studying students and classroom students were selected at random. Classroom students were selected at random by a process of identifying all teachers of Course 2 and Course 4 during the spring of 1972. From the list of all available teachers for these two courses, 16 teachers were identified; 8 four Course 2 and 8 for Course 4. The process of selection of these teachers was stratified according to the dimension of number of students

in class. Although the range of students in class was extensive, ranging from a low of 10 to a high of 50 students, only those teachers who had 25 to 35 students in their class were selected. This provided not only a large sample for the evaluation but also controlled for the variable of size of class.

The selection of self-studying students proceeded with the identification of the 15 largest cities in the continental United States. From these 15 cities, all self-studying students who resided within a one hour drive of the city were identified. From the total list of self-studying students studying Course 2 or Course 4, a list was generated by random selection method. At this time, teachers and self-studying students for all four conditions of the design were identified.

The next phase was the random distribution of the 8 Course 2 and 8 Course 4 teachers into condition A, B, C, or D. The result was that 2 teachers for each course, for each condition, were identified. Self-studying students were also randomly distributed along the four conditions of the design, for each course. Letters were then prepared and sent to the 16 teachers and the self-studying students. The letter sent to the teachers and the self-studiers requesting their assistance reflected the four conditions of the design. The letter to the self-studying students also included a postcard for responding to the invitation as well as a self-addressed, stamped envelope. For the students who were in the self-studying mode who elected to participate in this design, a second follow-up letter was sent giving them specific instructions on what they were required to do as a participant in this study. At the same time the second letter was sent, a request was placed to send a copy of the CRP to the students in conditions A and B.

Of the 16 teachers identified for the study, all agreed to participate. Of the 651 students identified as self-studiers who were invited to participate, 223 actually chose to accept the invitation according to one of the four

conditions given to them. Fifty-five students declined to participate, while 375 students did not respond. To provide a location for testing the self-studying students, 15 test coordinators were identified, one in each of the 15 major United States cities. With some rearrangements, all testing locations were eventually secured in time for implementation of the design. In total, 368 classroom or self-studying students participated in the Cassette Review Program evaluation.

The administration of the appropriate test to classroom students was conducted by the teachers according to instructions and a time schedule given to them. The 16 teachers were also given explicit instructions on what to tell their students, depending upon their assignment to condition A, B, C, or D. In addition, the teachers in conditions A and B were furnished with all CRP material to present to their students. Self-studying students were tested through 15 regional centers established for this purpose.

The examination used in the CRP evaluation as a measure of student knowledge of the CRP material was an objective multiple choice test with five options. The multiple choice tests were adapted and revised from an initial preliminary study evaluating the CRP for all ten courses (Langdon, 1971). The Course 2 test included 36 items while the Course 4 test included 26 items.

In addition to the multiple choice tests, an evaluation questionnaire of the CRP itself was also prepared. This questionnaire was included in material for all students in conditions A and B. The purpose of the questionnaire was to obtain data on the amount and type of use of the CRP as well as on technical aspects of the program.

Results

The results obtained from the examinations administered to both the self-studiers and classroom students were subjected to an Analysis of Variance with an unweighted-means solution (Winer, 1962, p. 242). The results indicated that

students who utilized the CRP, whether in a self-studying or classroom mode, did significantly better than students who did not use the CRP ($F = 14.528$, $P < .05$, df 3, 193, Course 2 and $F = 5.753$, $P < .05$, df 3, 120 for Course 4). These results are not likely to be obtained by chance alone, but rather reflect the important educational significance of the CRP. Generally, they indicate that students who utilized the CRP performed at a significantly higher level on the examinations than students who did not use the CRP, for both the self-studiers and classroom participants. The means of the test scores as well as the number of students are presented in Table I.

Insert Table I About Here

Generally, the results presented in Table I indicate a significant growth from the pretest situation to the posttest situation of knowledge as measured by the test included in the Cassette Review Program evaluation.

A second set of analyses were then conducted that compared the performance of students who utilized the CRP and those who did not utilize the CRP but did participate in this design, with the performance of all students who sat for the final exam for Courses 2 and 4, administered in June. In Table II, the results for the total number of students who sat for C.L.U. examination 2, as well as for the self-studiers and classroom students who participated in our evaluation, are presented.

Insert Table II About Here

The results obtained from a comparison between the final examination performance of students in the four conditions of the evaluation, with the final examination performance of all students, is presented in Table III for Course 2.

Insert Table III About Here

The results of this table indicate that two of the four groups in condition A and B which utilized the CRP did significantly better than the average for all students who participated in the final examination . Of the four groups in condition C and D which did not utilize the CRP, only one group did better than the norms. In total, five of the eight group scores were in the expected direction. Although not as conclusive as one might like, there is certainly an indication that the use of the CRP did significantly assist students in obtaining higher scores on the final C.L.U. examination. The explanation for why all the comparisons were not in the intended direction is as follows. The evaluation included an examination covering the content of the CRP for both the user and the nonuser of the program. The examination is conceivably a learning experience which could have increased one's final examination score.

The results of the comparison between students participating in the evaluation with the total group of students taking the Course 4 exams are presented in Table IV and Table V.

Insert Table IV About Here

Insert Table V About Here

The results indicate more positively that students who utilized the CRP in conditions A and B did significantly better than all students who participated in the examination of Course 4, for two of four possible cases. On the other hand, students who did not utilize the program in condition C and D did not do significantly better than all the students in any of the four cases. These results, in conjunction with data from Course 2, indicate and support the hypothesis that the CRP did significantly affect scores in a positive direction, for users of the CRP.

The final results of this analysis were obtained from the CRP Questionnaire. These results are presented in Table VI for all students who used CRP 2 and 4 together.

Insert Table VI About Here

Discussion

One summary indication forthcoming from the evaluation is not only the significance of the CRP as an instructional device, but the technical excellence with which it has been developed. The results of the CRP Questionnaire indicate that a favorable attitude exists among the users of the CRP. It is clear that the student will spend both time and money necessary to obtain the CRP as well as a cassette recorder to increase their knowledge in the C.L.U. program. The impact of a positive attitude on the part of the students can be substantiated with the results of this evaluation to indicate the important nature of the CRP.

One significant recommendation for the Cassette Review Program is the incorporation of the tests used in the evaluation as part of the CRP package. The student would utilize the instrument after a thorough study of the CRP booklet and tapes. The test, along with the rest of the key responses, could be used as a self-administered diagnostic instrument for the student's own self-evaluation.

TABLE I

Test Characteristics	No. of Items In Test	No. of Students SS*	CR*	Total	Mean Score SS	CR	Total
COURSE 4							
Group A (Pretest + CRP)	26	29	21	50	16.9	15.5	16.3
Group B (CRP + Posttest)	26	21	15	36	18.1	18.9	18.5
Group C (Pretest)	26	11	29	40	17.2	13.8	14.5
Group D (Posttest)	26	13	23	36	16.5	15.4	15.8
Course 2							
Group A (Pretest + CRP)	36	30	28	58	23.3	24.6	23.9
Group B (CRP + Posttest)	36	24	33	57	30.7	29.2	30.0
Group C (Pretest)	36	6	39	45	26.0	24.2	24.4
Group D (Posttest)	36	9	32	41	24.0	26.5	25.9

* SS = Self-studiers
CR = Classroom

TABLE II

Course 2

	N	MEAN	STANDARD DEVIATION
All Students	4095	75.95	10.00
Self-Studiers			
Group A	30	77.5	9.59
Group B	24	82.4	7.41
Group C	6	84.6	9.05
Group D	9	79.7	9.94
Classroom			
Group A	28	82.0	10.00
Group B	33	79.9	9.16
Group C	39	79.5	6.48
Group D	32	78.98	11.04

TABLE III

COURSE 2

	Self-Studiers	Classroom
Group A	$t = .841$ $P > .05$	$t = 2.92$ $P < .05$
Group B	$t = 4.08$ $P < .05$	$t = 1.89$ $P > .05$
Group C	$t = 1.899$ $P > .05$	$t = 3.340$ $P < .05$
Group D	$t = 1.05$ $P < .05$	$t = 1.88$ $P > .05$

TABLE IV

Course 4

	N	Mean	Standard Deviation
All Students	3748	76.61	11.31
Self-Studiers			
Group A	29	83.6	47.1
Group B	21	78.9	102.8
Group C	11	82.	83.5
Group D	13	78.4	115.2
Classroom			
Group A	21	79.5	89.0
Group B	15	80.6	52.9
Group C	29	79.1	96.5
Group D	23	79.8	90.9

TABLE V

Course 4

	Self-Studiers	Classroom
Group A	$t = 5.4$ $P < .05$	$t = 1.2$ $P > .05$
Group B	$t = .92$ $P > .05$	$t = 2.3$ $P < .05$
Group C	$t = 1.4$ $P > .05$	$t = 1.1$ $P > .05$
Group D	$t = .53$ $P > .05$	$t = 1.4$ $P > .05$

TABLE VI

	Cassette A	Cassette B	Cassette C
1. Hours per week one used:	2.34	2.33	2.32
Total hours spent on:	4.74	4.56	4.51
2. Did you ever use the review booklet without the cassette?	YES 40%		
If Yes, for which cassette?	33%	35%	33%
3. When you generally studied, did you use the Cassette Review Program?	YES 41%		

4. How did you use the CRP?

A) Read the material first and then listened to the recorded section	47%
B) Listened to the recording first and then read the material	38%
C) Read the text and listened without a specific order	15%

Information Transfer

5. How do you feel this means of information transfer compares to studying without the use of cassettes?

1	2	3	4	5	$\bar{X} = 2.11$
Cassettes are much better				Reading only is much better	

6. Would you continue to use the CRP?	92% indicated YES
7. Have you ever used a casette program before as a means of learning?	30% indicated YES
10. Have you ever received interest from friends or associates as to how they could use the CRP?	20% indicated YES

TABLE VI - Continued

Technical Information

Sound Quality - Reported as Mean Scores for each cassette

1. On a scale of 1 (clear) to 5 (fuzzy)

Cassette A	1.32
Cassette B	1.40
Cassette C	1.41

2. Speed of information - on a scale of 1 (too fast) to 5 (too slow)

Cassette A	2.75
Cassette B	2.63
Cassette C	2.76

3. Amount of information - on a scale of 1 (too much) to 5 (too little)

Cassette A	3.33
Cassette B	3.20
Cassette C	3.25

4. Wording of information - on a scale of 1 (clear) to 5 (unclear)

Cassette A	1.61
Cassette B	1.64
Cassette C	1.80

5. Were you able to obtain a recorder? 1 = with difficulty 2 = with ease
The mean is 1.82.

6. Did you have to pay for a cassette recorder to use the CRP? 47% indicated Yes
53% indicated No

N = 165

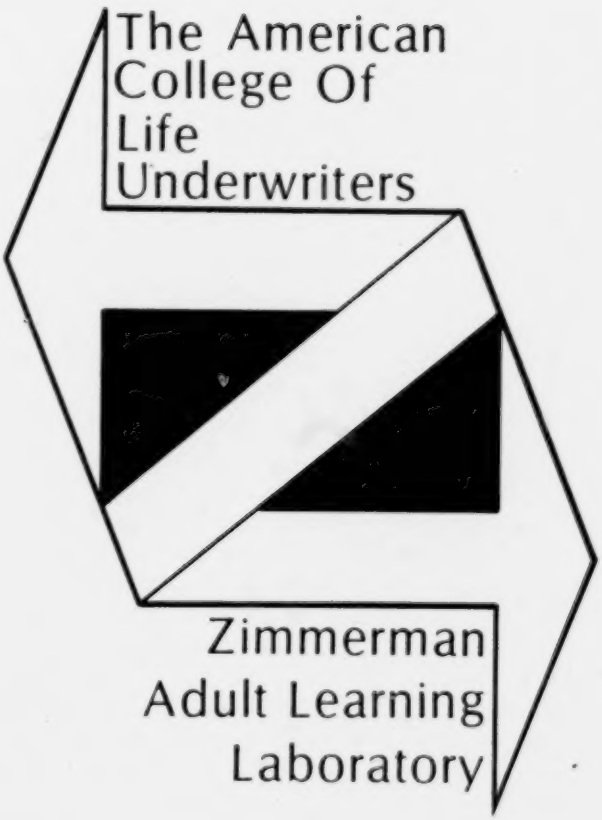
References

American College of Life Underwriters. Catalogue, 1971-1972.

Campbell, D. T. & Stanley, J. C. Experimental and Quasi-Experimental Designs For Research. Chicago: 1966. Rand McNally and Company

Langdon, D. L. In-house commentation on the evaluation of the Cassette Review Program. The American College of Life Underwriters, Bryn Mawr, Pennsylvania 1971.

Winer, B. J. Statistical Principles in Experimental Design. New York: McGraw-Hill, 1962.



270 Bryn Mawr Avenue/Bryn Mawr/Pa./19010